



THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

VILLAGE OF SUNDRIDGE

DISTRICT OF PARRY SOUND

1966

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DISTRICT OF PARRY SOUND

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Report on a water pollution
survey of the village of
Sundridge, district of Parry
Sound.

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Report

on a

Water Pollution Survey

of the

VILLAGE OF SUNDRIDGE

District of Parry Sound

October, 1966

Division of Sanitary Engineering

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ONTARIO WATER RESOURCES COMMISSION

R E P O R T

I INTRODUCTION

The purpose of this survey was to locate and record significant sources of water pollution within the Village of Sundridge. Surveys of this nature are conducted routinely and upon request throughout the Province of Ontario by the Ontario Water Resources Commission. This forms a basis for evaluating any existing or potential sources of pollution.

Recommendations are made pertaining to water pollution abatement, and the Commission expects that corrective measures will be taken by those concerned.

Where water and pollution control works appear desirable or expansions to present facilities are necessary, the Ontario Water Resources Commission (OWRC) has a programme to aid in the construction and financing of these works. The Commission also sponsors courses for plant operators, to assist them in the operation and maintenance of water pollution control facilities and water works.

II GENERAL

(1) Location

The Village of Sundridge has a residential population of 786 as recorded in the 1965 assessment. The village is located on the north shore of Lake Bernard, 170 miles north of Toronto on

Highway No. 11. There are summer camps, private cottages and commercial tourist premises located on the shores of Lake Bernard, resulting in a considerable increase in population and business endeavours during the tourist season.

(2) Drainage

Drainage for the village is provided by Lake Bernard and its tributaries.

III WATER USES

(1) Water Supply

There is no municipal water works. Water is obtained from private wells and Lake Bernard. Many of the wells adjacent to the shoreline area are artesian and overflow at the ground surface. Overflow from these wells is conducted by open ditches or storm drains to Lake Bernard. Reportedly, premises in the northern end of the municipality, where the higher elevation exists, have experienced some difficulty in obtaining an adequate water supply from private wells.

(2) Recreational

Lake Bernard is used extensively for boating, swimming, water sports and fishing and is a major attraction for tourists to the area.

IV WATER POLLUTION

(1) Sanitary Waste Disposal

(a) Existing Conditions - Septic tanks and tile beds are reportedly the most common method of sewage disposal. The installation of these private sewage disposal systems in older premises without

inspection or supervision, has resulted in inadequate systems causing overflow or ponding of sewage effluent. Reportedly, the village under the supervision of the Medical Officer of Health is actively engaged in the locating and repairing of malfunctioning systems. Since the overflow from artesian wells is directed to Lake Bernard via the normal drainage conduits the resulting dilution of any sewage effluent which may gain access to these watercourses must be considered in assessing the results of the appended laboratory analyses.

(b) Proposed Sewage Works - In reply to a request from the municipality this Commission carried out a preliminary investigation of the water and sewage requirements for the Village of Sundridge on May 6, 1964. The combined cost of both facilities was estimated and it was recommended that a consulting engineering firm should be engaged to prepare a preliminary engineering report. No action on this recommendation has been forthcoming.

(2) Refuse Disposal

A municipal dump serving the village is located near the end of Paget Street approximately 0.75 miles north of Highway No. 11 on parts of Lots 22 and 23, Concession No. 10 in the Township of Strong.

A small watercourse, known locally as Sundridge Creek is located on the north side of the dump and flows southeast to Lake Bernard.

A 12-foot wide dyke has been constructed between the dump

face and the watercourse. This dyke has recently been compacted and widened and the possibility of leachate gaining access to the watercourse has been minimized.

Samples collected from the creek upstream and downstream from the dump during inspections in August 1965 and July 1966 are listed below:

<u>Date Sampled</u>	<u>Sampling Point</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Phenols (ppb)</u>
Aug.10/65	S-1 Sundridge Creek upstream from dump.	1.3	136	2	134	0
July 5/66	"	1.5	30	6	24	-
Aug.10/65	S-2 Sundridge Creek 75-feet downstream from dump.	1.3	80	4	76	2
July 5/66	S-2 Sundridge Creek downstream from dump at road allowance between Concs. 10 and 11.	1.1	56	7	49	4

<u>Date Sampled</u>	<u>Sampling Point</u>	<u>M.F.Coliforms per 100 ML</u>	<u>Total Coliforms per 100 c.c.</u>	<u>MPN E. coli per 100 c.c.</u>
Aug.10/65	S-1	2,900		
July 5/66	S-1		75	23
Aug.10/65	S-2	1,900		
July 5/66	S-2		430	39

The laboratory results are generally satisfactory although the downstream samples contained phenols. This would appear to indicate that some phenolic-type industrial waste is being disposed of at the dump. Due to the proximity of this dump to a watercourse it would be advisable to limit the refuse to domestic garbage and inorganic debris.

(3) Industrial Waste Disposal

Industry in the village is minimal. However, significant sources of pollution from the commercial premises, the Blue Ribbon Dairy, Caswells' Hotel Bernard Motor Court and Cottages, were found.

(a) Blue Ribbon Dairy - This establishment pasteurizes milk and makes butter.

Previous Commission correspondence to Blue Ribbon Dairy Limited has recommended that all processing wastes other than cooling water be prevented from discharging to Bernard Lake.

The results of the most recent analyses of wastes from the dairy to Lake Bernard are listed below:

<u>Date Sampled</u>	<u>Sampling Point</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>
Aug.10/65	Effluent from Blue Ribbon Dairy.	560	96	19	77
June 20/66	Effluent from Blue Ribbon Dairy.	140	746	40	706

<u>Date Sampled</u>	<u>Sampling Point</u>	5-Day BOD <u>(ppm)</u>	Total <u>(ppm)</u>	<u>Solids</u> Susp. <u>(ppm)</u>	Diss. <u>(ppm)</u>
July 5/66	Dairy Effluent	16	162	20	142

<u>Date Sampled</u>	<u>Sampling Point</u>	M.F. Coliforms <u>per 100 ML</u>	<u>MPN</u> Total Coliforms <u>per 100 c.c.</u>	E.coli <u>per 100 c.c.</u>
Aug.10/65	Effluent from Blue Ribbon Dairy.	19,300,000	-	-
June 20/66	Effluent from Blue Ribbon Dairy.	-	-	-
July 5/66	Dairy Effluent	-	11,000,000+	11,000,000+

The above laboratory results confirm the necessity of remedial alterations to the waste disposal practices at Blue Ribbon Dairy.

Recent correspondence from the Industrial Waste Division of this Commission confirmed that a proposal to install a holding tank and subsequent disposal of the contents on farm lands outside the village was discussed.

The Commission's field staff will be assessing the acceptability of this proposal during subsequent inspections.

(b) Caswells' Hotel Bernard Motor Court and Cottages - Sanitary wastes from the hotel and associated buildings are disposed of by means of septic tanks and tile fields. The tile field that serves the hotel building is underdrained to a pumpwell from which it is pumped approximately 500 feet into Lake Bernard. This point

of discharge is shown as B-4.2 P on the appended map and in Table No. 1. Chlorine is added to the pumpwell contents by means of a Wallace and Tiernan hypochlorinator which is located in the basement of the hotel.

There was no available chlorine residual in the pumpwell effluent on July 5, 1966 when the samples, the results of which are listed below, were collected:

<u>Date Sampled</u>	<u>Sampling Point</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>
July 5/66	B-4.2 P Hotel Bernard efflu- ent at pump- well.	57	304	62	242

<u>Date Sampled</u>	<u>Sampling Point</u>	<u>Total Coliforms per 100 c.c.</u>	<u>MPN E.coli per 100 c.c.</u>
July 5/66	B-4.2 P	11,000,000+	11,000,000

The high BOD and suspended solids concentration and the excessive coliform count indicate the necessity of continued chlorination of this effluent as a minimum control to prevent the discharge of inadequately treated waste to Lake Bernard.

(c) Discussion - Adequate treatment of wastes from both premises, the Blue Ribbon Dairy and Casswells' Hotel is hindered by similar problems of large volumes of waste and insufficient available area to provide an acceptable private sewage disposal installation.

The ultimate solution to waste disposal problems at both premises appears to be the provision of a municipal sewerage system.

(4) Discussion of Sample Analyses

Samples were collected from Lake Bernard in the vicinity of Sundridge and from local watercourses which provide drainage for the village. The sampling points are indicated on the appended map. The samples were submitted to the Ontario Water Resources Commission Laboratory for chemical analyses, while bacteriological examinations were performed at the Ontario Department of Health Regional Laboratory at Orillia. The laboratory results and a glossary of terms are appended to this report.

The results of the samples taken from Lake Bernard offshore from the central vicinity of the village, numbered B-4 to B-7 in Table No. 2 reported coliforms in excess of the Commission's maximum objective of not greater than 2,400 coliforms per 100 ml for surface waters in the Province of Ontario. The samples collected offshore from the eastern and western sections of the village were satisfactory.

The results of the samples collected from the local watercourses are recorded in Table No. 1. The bacteriological examination revealed that nine of the fourteen samples collected showed excessively high bacterial pollution. These results appear to indicate that effluent from inadequate sewage disposal systems is gaining access to Lake Bernard via the local drainage ditches. These high coliform counts are more significant since overflow from artesian wells which also flow to these ditches results in considerable dilution of the contaminating wastes.

V SUMMARY AND CONCLUSIONS

It can be concluded from this survey that pollution of the drainage courses within the village will result in continuing deterioration of Lake Bernard.

Significant sources of pollution were found to be from the Blue Ribbon Dairy and Casswells' Hotel. The high coliform density reported in samples collected from local watercourses indicate that waste from unknown inadequate private sewage disposal facilities are gaining access to the drainage ditches within the village.

Blue Ribbon Dairy Limited have indicated to Commission field staff that they plan to install a holding tank to collect all wastes for ultimate disposal on farm lands.

Casswell's Hotel has facilities to chlorinate the effluent prior to discharge to Lake Bernard. Closer supervision is required to assure continuous and adequate chlorination.

When malfunctioning waste disposal systems are located, the municipality under the direction of the Medical Officer of Health requests that the offending parties effect the necessary repairs.

The installation of adequate private sewage disposal systems in the central business section of the village is made more difficult by insufficient available area and in some instances large volume of wastes. The installation of a municipal sewerage system is considered the appropriate method to solve the sewage disposal problems in the Village of Sundridge.

VI RECOMMENDATIONS

- (1) Blue Ribbon Dairy Limited should effect immediate alterations to their waste disposal facilities to eliminate the discharge of contaminating wastes to Lake Bernard.
- (2) Casswells' Hotel Bernard should provide continuous chlorination of all sewage effluent that is discharged to Lake Bernard.
- (3) The municipality should initiate a water pollution control project.

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APPENDIX

EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

(A) Bacteriological examinations were performed on samples from the watercourse. The Most Probable Number and Membrane Filter techniques were used to obtain an enumeration of coliform and/or Escherichiacoli organisms. These organisms are normal inhabitants of the intestines of man and other warmblooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as Coliform and E.coli count per 100 c.c.

The Commission's objective for surface waters in Ontario is a coliform count of not greater than 2,400 organisms per 100 c.c.

(B) Chemical Analysis

The chemical analysis performed on stream and outfall samples included determinations for biochemical oxygen demand, suspended solids and in some instances, turbidity.

(I) Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters, or industrial wastes. The completion of the test requires five days under the controlled incubation temperature of 20°C. The Commission's water quality objectives

- (i) for stream water - a 5-Day BOD of not greater than 4 ppm.

- (ii) for storm sewer, sewage treatment plant and industrial waste discharges - a 5-Day BOD of not greater than 15 ppm.

(II) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (ppm) is generally the most significant of the solids analysis in regard to stream water and outfall discharge qualities.

The OWRC objective for a discharge is a suspended solids concentration of not greater than 15 ppm.

(III) Turbidity

Turbidity is caused by the presence of suspended matter such as clay, silt, finely divided organic matter and plankton and is an expression of the optical property of a sample. The results are reported in "Silica Units".

VILLAGE OF SUNDRIDGESAMPLE ANALYSESTABLE I (CREEK SAMPLES)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>MPN Total Coliforms per 100 c.c.</u>	<u>E.coli per 100 c.c.</u>
S-0.3	Sundridge Creek at Hwy. No. 11.	July 5/66	1.0	46	4	42	75	23
S-0.1	Sundridge Creek at Main Street.	July 5/66	0.9	58	5	53	430	430
S-0.0	Sundridge Creek at mouth.	July 5/66	1.1	38	4	38	430	230
B-3.4 D	Ditch as indicated on Map.	July 5/66	0.8	112	6	106	230	23
B-3.8 D	Gulleys' Creek at mouth.	July 5/66	3.8	180	10	170	11,000,000+	230,000
B-4.0 D	Ditch as indicated on Map.	July 5/66	Insufficient flow to sample.					
B-4.2 P	Hotel Bernard effluent to Bernard Lake at Pumpwell.	July 5/66	57	304	62	242	11,000,000+	11,000,000
B-4.2 D	Ditch southwest of Hotel Bernard.	July 5/66	2.9	100	33	67	230,000	230

TABLE I (CONTD)

Sampling Point No.	Description	Date	5-Day BOD (ppm)	Total (ppm)	Solids Susp. (ppm)	Diss. (ppm)	Total Coliforms MPN per 100 c.c.	E.coli per 100 c.c.
B-4.3 D	Ditch at foot of Paget Street.	July 5/66	0.6	110	7	67	11,000,000+	0
B-4.31 D	Ditch at foot of James Street.	July 5/66	2.6	68	6	62	430,000	23,000
B-4.3 D1	Ditch 100 feet east of Paget Street.	July 5/66	6.0	104	10	94	29,000	4
B-4.5 D	Ditch between William and Yonge Street at mouth.	July 5/66	1.8	108	6	102	23,000	230
B-4.7 I	Blue Ribbon Dairy 6-Inch concrete outfall.	July 5/66	16	162	20	142	11,000,000+	11,000,000+
B-4.7 D	Ditch at foot of Market Street.	July 5/66	1.4	82	8	74	11,000,000	2,300
B-4.8 P	Private 2-Inch drain to Bernard Lake.	July 5/66	0.2	72	2	70	1,500	4

VILLAGE OF SUNDRIDGE

SAMPLE ANALYSES

TABLE 2 (LAKE BERNARD SAMPLING POINTS)

Sampling Point No.	Description	Date	5-Day BOD (ppm)	Total (ppm)	Solids Susp. (ppm)	Diss. (ppm)	MPN	
							Total Coliforms Per 100 ML	E.coli
B-1	Lake Bernard	July 5/66					120	0
B-2	Lake Bernard	July 5/66					430	0
B-3	Lake Bernard	July 5/66					230	23
B-4	Lake Bernard	July 5/66					21,000	230
B-5	Lake Bernard	July 5/66					4,300	23
B-6	Lake Bernard	July 5/66					2,300	230
B-7	Lake Bernard	July 5/66					4,300	23
B-8	Lake Bernard	July 5/66					1,500	9
B-9	Lake Bernard	July 5/66	1.2	74	7	67	430	23

Additional Analyses

			Hardness as		Alkalinity as		Iron as	Chloride as	pH at
			CaCO ₃ (ppm)		CaCO ₃ (ppm)		Fe (ppm)	Cl (ppm)	Lab.
B-9	Lake Bernard	July 5/66		16		11	0.11	1	7.6

